

REMARKS

Applicants respectfully request reconsideration of the above-captioned application as well as the Information Disclosure Statement filed on December 23, 2003. Claims 1-21 are currently pending. In reply to the Office Communication of April 19, 2004, current claims 7 and 21 have been added to the listing of claims. The Preliminary Amendment filed with the application was inadvertently overlooked when gathering the claims for the listing, for which the undersigned apologizes.

The Office Action includes a rejection of claims 14-17 under 35 U.S.C. § 112, second paragraph, noting an obvious typographical error in the dependency of claims 14-17. The Examiner is correct. Claims 14-17 should have been dependent upon claim 13, rather than claim 12. It is respectfully submitted that one of ordinary skill in the art would have realized the intended dependency in light of this obvious error. The Examiner's diligence in this regard is noted with appreciation and reconsideration and withdrawal of this rejection are respectfully requested.

The Office Action includes a rejection of claims 1-13, 18 and 19 under 35 U.S.C. § 103 as allegedly being unpatentable over the O'Rourke patent (U.S. Patent No. 6,559,848).¹ This rejection is respectfully traversed.

It is first noted that the present application is based on Korean Patent Application Nos. 2000-70090 and 2001-40704, the first of which was filed on November 23, 2000, several weeks before the filing of the O'Rourke patent. Though not argued at this time,

¹ It is noted that the text of the rejection includes mention of claims 20 and 21.

Applicants reserve the right to file a certified translation of the first priority document to overcome this rejection.

The O'Rourke patent involves a coding and decoding apparatus for three dimensional data. It operates on a frame by frame basis. Specifically, each frame contains information about a "bone" of x, y, z space vectors in 3D data at a particular instant of time. This information, as disclosed in column 2, lines 10-20, includes displacement of a start of the bone from the end of its parent bone, the orientation of the bone relative to the orientation of the parent bone, one or more scaling factors that define the scale of the bone in 3D space and the time of displacement, orientation and scaling.

The Office identifies the start of the bone, apparently, as a break point. However, Applicants respectfully disagree with the characterization of the applied art as meeting the claim recitations. For instance, as disclosed in column 2, beginning at line 44, key frames of the animation filtered such that frames that are duplicates are relatively close in content to preceding and succeeding frames can be removed to reduce the amount of data that must be transmitted, in the O'Rourke system. On the receiving side, the frames that were filtered as being duplicates or relatively close are then identified as "missing frames" which are then generated based on information received with respect to the key frames that are transmitted and "known interpolation techniques", as disclosed at column 5, lines 30-38. It must be emphasized that this filter function occurs at the time of encoding, whereas the interpolation function occurs at the time of decoding which generally speaking would be at two different points in a network, for instance.

The O'Rourke patent therefore operates on a fundamentally different approach than the present invention. Specifically, the present invention, as articulated in claim 1, involves an apparatus for compressing *an animation path*. This distinction found in the preamble of claim 1 is reflected in the body of the claim. For instance, claim 1 further recites an interpolator analysis unit *for extracting a number of break points from an animation path* and outputting keys and key values corresponding to the break points. Hence, rather than speaking of omitting frames that are duplicates or relatively close in content to preceding or succeeding frames, the present invention actually talks in terms of compressing an animation path and more particularly to an interpolator analysis unit that extracts a number of break points from the animation path. As such, the O'Rourke patent does not teach of keys and key values corresponding to the break points of an animation path. Instead, it codes time scaling displacement and orientation on a frame of 3D data which in isolation may sound similar to the "key coder" and "key value coder" of claim 1 but in the context of extracting break points from an animation path actually bears little resemblance to the recitations of claim 1 since the O'Rourke apparatus does not compress an animation path.

Further, with respect to claim 2, for instance, the interpolator analysis unit determines the number of break points so that the difference the approximate animation path and the original animation path is minimized. While the affects of the two systems may be somewhat similar when viewed by graphing a particular point of the animation over time, the actual apparatus used in the compression of the animation path is far different. This is easily understood when one understands that the O'Rourke patent does not involve

an interpolator analysis unit, or any form of interpolation, at the encoding stage. Instead, this occurs at the decoding stage because frames are missing from the received transmission of 3D data.

This distinction is found in other independent claims such as claim 8 which recites an apparatus for reconstructing *an animation path and involves an interpolator reconstruction unit for obtaining empty key values by linear interpolation based on the keys and key values decoded by the key decoder and key value decoder, respectively, and reconstructing the original animation path.* It is respectfully submitted that this is not contemplated in the O'Rourke patent.

Similarly, independent method claims 11 and 12 recite a method for compressing an animation path and a method of reconstructing an animation path and respectively recite extracting a number of break points from an original animation path and reconstructing an original animation path by obtaining empty key values by linear interpolation based on the decoded keys and key values.

Independent claim 13 also is distinct from the O'Rourke patent for reciting, *inter alia*, an array type key flag for indicating key values of which axes are selected among key values corresponding to an x, y or z coordinate of each *break point of the animation path, etc.*

Finally, independent method claim 18 also recites a method of extracting break points of an animation path with significant detail such as selecting two break points at both ends of the original animation path, selecting one break point from among the remaining

break points excluding the two selected break points, interpolating key values of the remaining break points including the selected break points using the selected break points and forming an approximated path based on the selected break points and the interpolated key values, selecting an approximate of the animation path which has the smallest path difference between the original animation path and the approximated animation path, and selecting break points corresponding to the selected animation path. Finally, claim 18 recites selecting one break point along remaining break points excluding the break points selected in steps a and b and repeating steps c and e until the path difference is less than the allowable difference. An exemplary embodiment of this can be found in Figures 8a-8h and 14a-14f, for instance.

It is noted that at various points in the Office Action, the Office suggests that various elements of the claims would have been obvious to one of ordinary skill in the art for various motivations. With respect to claim 1, it is respectfully submitted that the Office has interpreted the O'Rourke patent differently than the undersigned or not fully appreciated the impact of the words found therein. With respect to claim 6, for instance, the Office suggests that one of ordinary skill in the art would have been motivated to minimize area differences because he or she would want to "create an accurate representation of the original path." First, this comment is not applicable to the O'Rourke patent since it does not speak of animation paths, and second, the stated motivation is far too broad to suggest the specific modifications that would be necessary for the O'Rourke patent to meet the claim recitations. Similar comments apply with respect to the Office's

suggested motivation for meeting the recitations of claim 13. Undoubtedly other distinctions exist between the present invention as articulated in the pending claims and the applied art. However, these further distinctions will not be identified or belabored for sake of brevity.

In light of the foregoing, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections and earnestly solicit issuance of a Notice of Allowance. Should any residual issues exist, the Office is invited to contact the undersigned at the number listed below.

Respectfully submitted,

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By: _____



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